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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/582,982	07/10/2000	KATSUNORI ITOU	49657-742	4615
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MCDERMOTT WILL & EMERY				
600 13TH STREET NW				
WASHINGTON, DC 20005-3096				
		EXAMINER		
		WILKINS III, HARRY D		
		ART UNIT PAPER NUMBER		
		1742		

DATE MAILED: 03/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/582,982	<b>Applicant(s)</b> ITOU ET AL.	
	<b>Examiner</b> Harry D Wilkins, III	<b>Art Unit</b> 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 2 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>020904</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 February 2004 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adachi et al (JP 06-293939, with reference to the machine translation) with support from Ochi et al (US 5,705,124).

Adachi et al teach (see abstract) bearing parts that are made from a high carbon, chromium steel that are used at high temperatures due to their excellent rolling fatigue values. Adachi et al teach (see Table 1) example steel no. 6, which contains 1.01 wt% C, 0.42 wt% Si, 0.39 wt% Mn, 0.012 wt% P, 0.012 wt% S, 1.63 wt% Ni, 2.37 wt% Cr, 0.039 wt% Al, 0.0081 wt% N, 0.0012 wt% Ti, 0.0011 wt% O and the rest Fe. Adachi et al teach (see paragraph 34 and Table 2) that the process of treating the steel was to

harden at 840°C with an oil quench, followed by tempering at 220°C, which method produces a part that has a hardness of HRC 59.0.

This composition is within the presently claimed range, with the exception of the value of Si. However, the value of Si disclosed by Adachi et al is (see abstract) less than 0.5 wt%. The presently claimed composition range of Si would have been obvious to one of ordinary skill in the art because the prior art range is close enough, e.g.- 0.4999 wt% vs. 0.5 wt%, that it would have been expected to have the same properties, see MPEP 2144.05.I. In addition, the value of example steel no. 6, 0.42 wt%, is close enough to the presently claimed range that one of ordinary skill in the art would have expected the steel to have the same properties. Applicant has not demonstrated unexpected results within the presently claimed range with comparison to the disclosed range of Adachi et al.

Adachi et al teach that the mean carbide size for example 6 is 0.43  $\mu\text{m}$ , but do not mention the maximum carbide size. However, as the composition of Adachi et al had an nearly identical composition and was treated by an identical process, one of ordinary skill in the art would have considered the steel of Adachi et al to possess a maximum carbide size of less than 8  $\mu\text{m}$  as claimed.

Adachi et al do not expressly teach that the bearing parts are part of an antifriction bearing, however, the bearing parts of Adachi would have been expected by one of ordinary skill in the art to inherently have antifriction properties (a requirement for bearing steels) and, thus, the bearing parts would have been incorporated into an

antifriction bearing, which is made from at least three parts, an inner ring, an outer ring and a rolling element (e.g.-roller or ball) as disclosed by Ochi et al at col. 1, lines 5-10.

Regarding claim 2, Adachi et al teach (see paragraph 24) that 0.03-2 wt% V may be added to the steel for creating small carbonitrides (charcoal nitride) and for raising temper-softening resistance.

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takata et al (US 4,642,219) in view of Ochi et al (US 5,705,124) and Applicant's admission of prior art, and further in view of "High Carbon Chromium Bearing Steels".

Takata et al teach (see abstract) a bearing steel which contains, by weight, 0.7 to 1.1% C, 0.15 to 1.6% Si, 0.15 to 1.15% Mn, less than 0.010% P, less than 0.002% S, 0.5 to 1.6% Cr, less than 0.015% Al, less than 0.0015% Ti, less than 0.0006% O, less than 0.005% N and the balance iron. The ranges of P, S, Cr, Al, Ti, O and N are within the presently claimed ranges. The ranges of C, Si and Mn overlap the presently claimed ranges. See MPEP 2131.03.

Takata et al do not teach that the bearing steel contains 0.53 to 3.0% Ni.

Ochi et al teaches a bearing steel that is similar in composition to the bearing steel of Takata et al. Ochi et al teach (see col. 5, lines 14-23) that Ni can be added at 0.1 to 2.0% to bearing steels for the purpose of improving the hardenability and extending the life of the bearing steel.

Therefore, it would have been obvious to one of ordinary skill in the art to have added Ni as taught by Ochi et al to the bearing steel of Takata et al because Ochi et al teach that Ni improves hardenability and extends the life of bearing steels.

The claim is directed to a "part" of an antifriction bearing having an inner ring, an outer ring and a rolling element. Takata et al in view of Ochi et al do not expressly teach that the steel is used as a part of an antifriction bearing, however, the bearing steel of Takata et al in view of Ochi et al would have been expected by one of ordinary skill in the art to have antifriction properties and, thus, be made into an antifriction bearing, which contains an inner ring, an outer ring and a rolling element (e.g.-roller or ball) (for support see Ochi et al at col. 1, lines 5-10).

Takata et al teach (see col. 5, lines 3-9) that the bearing steel is quench hardened and then tempered at 170°C. Thus, Takata et al do not teach that the bearing is tempered at 180 to 350°C.

However, Applicant admits as prior art (see page 2, lines 7-12 of specification) that it was well known in the art to perform a high temperature tempering (300°C) on high temperature use bearing steels that have been quench hardened, such as SUJ2 or the like, or carbonitrided, such as SCM 420 or SNCM 815, in order to attain dimensional stability for use at high temperatures.

"High Carbon Chromium Bearing Steels" at page 1, in Table 2, describes the standard Japanese steel "SUJ2". SUJ2 steel has a composition that is very similar to the composition disclosed by Takata et al and Ochi et al. Thus, one of ordinary skill in the art would have expected the bearing steel of Takata et al in view of Ochi et al to have properties similar to SUJ2 steel.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the bearing steel of Takata et al in a high-temperature bearing because the similar

steel SUJ2 had been known to be used in high-temperature bearings and SUJ2 steel and the steel of Takata et al in view of Ochi et al have similar properties. The defects of the prior art SUJ2 high temperature bearing (see page 2, lines 13-16 of specification) were that the bearing had lower hardness, thus producing lower fatigue life and wear resistance. However, as disclosed by Ochi et al, the Ni improves the hardenability of the alloy, thus, overcoming the problem associated with the prior art.

Therefore, it would have been obvious to one of ordinary skill in the art to have applied the conventional processing step of high-temperature tempering after quench hardening or carbonitriding to the bearing steel of Takata et al in view of Ochi et al because the high-temperature tempering aids the bearing in dimensional stability for use at high temperatures.

The claim states "having a structure subjected to tempering after quench hardening or carbonitriding, wherein the hardness after said tempering is at least HRC 58 when tempered at a temperature in a range of 180°C to 350°C and the maximum carbide size is not more than 8  $\mu\text{m}$ ". With respect to the property of hardness and maximum carbide size, the alloy composition taught by Takata et al in view of Ochi et al overlaps the alloy composition recited in the claims and the processing method of Takata et al in view of Applicant's admission of prior art and "High Carbon Chromium Bearing Steels" is identical to the process recited in the claims, and, therefore, one of ordinary skill in the art would have expected that the products taught by the references would have the same hardness and maximum carbide size as claimed.

Regarding claim 2, Takata et al teach (see abstract) optionally adding 0.05 to 0.50% Mo and 0.05 to 0.30% V.

**Response to Arguments**

5. Applicant's arguments filed 09 February 2004 have been fully considered but they are not persuasive. Applicant argued that:

- a. The Examiner ignored and/or dismissed the claim limitation requiring at least 0.5 wt% silicon.

In response, as can be seen above and in the previous rejection, the Examiner did not dismiss or ignore the claim limitation of the range of silicon. In fact, the Examiner showed why one of ordinary skill in the art would have considered the claim limitation to be obvious. Particularly, that the range of silicon disclosed by Adachi et al is so close to the presently claimed range, e.g.-0.499999 wt% vs. 0.50 wt%, that one of ordinary skill in the art would have expected the two alloys to have the same properties. For a more complete discussion, please see MPEP 2144.05.I, including the discussion of *In re Geisler*. Additionally, as Applicant merely amended the claimed range of silicon to overcome the prior art, and did not expressly teach the advantages of the presently claimed range in the specification as filed, Applicant cannot argue unexpected results within the presently claimed range without raising issues of new matter.

- b. The significance of the 0.5 wt% silicon limitation can be seen in Mitamura et al.

In response, the Examples pointed out in Mitamura et al have no bearing on the instant application since there are other variables that affect the hardness, including the



presence of Ni (which Mitamura et al lack), the amount of C present and the amount of C present after carbonitriding. These variables, in affecting the hardness of the bearing alloy, raise issues that make the reliance upon Mitamura et al moot. Also, Applicant should not rely upon the disclosure of another patent, but upon the Application as filed, to provide reasons for unexpected results.

c. Adachi et al teach away from the present invention.

In response, while it is true Adachi et al do teach that increasing above 0.5 wt% produces poorer results, there is still a *prima facie* case of obviousness since, even though the prior art does not meet the claimed range, it is close enough that one of ordinary skill in the art would have expected it to have the same properties. This has been well established as sufficient grounds for a *prima facie* case of obviousness.

d. The Examiner failed to provide any factual evidence to support the conclusion that one having ordinary skill in the art would have recognized that the steels of Takata et al, Ochi et al and SUJ2 were suitable for high temperature use.

In response, Applicant's attention is directed to the Examiner's position as stated in the previous Office Action (mail date 10 Oct 2003). Particularly, the paragraph spanning pages 7 and 8. It is the Examiner's opinion that the facts of the prior art support the rejection.

### **Conclusion**

6. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the

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grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-Th 10:00am-8:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Harry D Wilkins, III  
Examiner  
Art Unit 1742

hdw

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